ENGINEERING EVALUATION REPORT
KEATON'S MORTUARY
PLANT NUMBER 14968
APPLICATION NUMBER 6416

BACKGROUND

Keaton's Mortuary has applied to obtain an Authority to Construct a human cremator at their facility in San Rafael, CA. The cremator is a source of toxic air contaminants and is proposed to be located within 1000 feet of the nearest school. The cremator is subject to a health risk screening analysis, and public notice requirements of Regulation 2-1-412.

A health risk screening was performed (11/25/02), and it was determined that a total number of 1666 cremations can be done in a year resulting in a maximum cancer risk of 10 in a million and a chronic hazard index of less than one. These levels of risk are considered acceptable under the District's Risk Management Policy for operations that comply with the requirements of TBACT. The cremator will comply with TBACT as determined in the TBACT determination section of this report.

The application covers the following source:

S-1 Crematory Retort for human remains, I.E.&E. Company, Model IE43-PPII, with an integral afterburner, natural gas fired, 1.8 MMBTU/hr, 100 lbs/hr max.

EMISSION CALCULATIONS

1. Natural Gas Combustion

Basis:

1. Firing rate = 1.8 MMBTU/hr; average gross heating value of natural gas = 1000 BTU/cu.ft.; Natural gas usage = 1800 cu.ft./hr.
2. Operating schedule: 16 hrs/day; 7 days/wk; 52 wks/yr.
3. Emission factors

   Emission factors for PM10, SO2, NOX, CO, and POC are taken from AP-42, 1/95, Table 1.4-1, and 1.4-3..

Emission Rate:

Pollutant	lb/MM cu.ft.	Lb/hr	Lb/day	ton/yr
PM-10	12	0.0216	0.346	0.063
NOX	100	0.18	2.88	0.524
SO2	0.6	neg.	neg.	neg.
CO	20	0.036	0.576	0.105
POC	8.0	0.014	0.23	0.042

2. Pathological Waste Combustion

Basis:

a. Creamation Rate = 100 lbs/hr; 0.8 ton/day; 291 tons/yr
b. Operating schedule: 16 hrs/day; 7 days/wk; 52 wks/yr

c. Emission factors are taken from the 8/3/94 memo of Eugene Wilner.

Emission Rate

Pollutant	EF, lb/ton	lb/day	ton/yr
PM-10	3.0	2.4	0.437
Nox	3.0	2.4	0.437
Sox	1.0	0.8	0.146
CO	2.5	2.0	0.364
POC	0.1	0.08	0.015

EMISSION SUMMARY

PM-10 = 0.063 tpy + 0.437 tpy = 0.5 tpy
NOx = 0.524 tpy + 0.437 tpy = 0.961 tpy
SOx = 0.146 tpy
CO = 0.105 tpy + 0.364 tpy = 0.469 tpy
POC = 0.042 tpy + 0.015 tpy= 0.057 tpy

PLANT CUMULATIVE INCREASE

PM-10 = 0.5 tpy
NOX = 0.961 tpy
CO = 0.469 tpy
POC = 0.057 tpy
Sox = 0.146 tpy

TOXIC EMISSIONS AND RISK SCREEN ANALYSIS

Emissions of toxic compounds and risk screening analysis is presented in the attached memo dated 11/25/02 from Jane Lundquist. In conclusion, 1000 human remains can be cremated in a year with a cancer risk of 6 in a million and hazard index of 0.2. A total of 1666 human remains can be cremated per year resulting in a cancer risk of 10 in a million and hazard index of 0.333. A cancer risk of 10 in a million is acceptable under the District's Risk Management Policy if the cremator operation complies with TBACT. The cremator will comply with TBACT.

TBACT DETERMINATION

TBACT for a cremator is firing with natural gas and the operating temperature in the secondary chamber at or above 1650 degrees Fahrenheit (Ref: CARB Test Report #ARB/ML-93-032, October 1992).

STATEMENT OF COMPLIANCE

On the basis of the information submitted, the cremator will comply with the requirements of Regulations 6-301, Ringelmann 1 Limitation, and 6-310, Particulate weight limitation.

The project is ministerial in nature and therefore exempt from CEQA review (PHBK Chapter 11.5).

A toxic risk screen analysis is required because toxic compound emissions are expected above the toxic trigger levels. The cremator is subject to and complies with the requirements of TBACT.

BACT, and offset requirements of Regulation 2 Rule 2 are not triggered for NOX and POC emissions less than 10 lbs/day, and for a facility with less than 15 tpy of emissions respectively.

The source is subject to the public notification requirements of Regulation 2-1-412, Public Notice, Schools, because the facility is located within 1000 feet of the nearest school.

NSR, PSD, NSPS, and NESHAPS are not triggered.

PERMIT CONDITIONS

S-1, Crematory Retort:

1. The cremator's operating rate shall not exceed 100 pounds per hour, and a total number of cremations per consecutive 365 days period shall not exceed 1666. A daily record for the operating hours, number of cremations, and the operating rate shall be kept in a District approved logbook to demonstrate compliance with this condition. The records shall be kept on site for at least 24 months from the date of data entry and be made available to the District staff for inspection.
   (basis: cumulative increase; toxic risk screen)
2. The operating temperature in the secondary chamber of the cremator shall not be less than 1650 degree Fahrenheit during the cremation mode. Any temperature excursion below 1600 degree Fahrenheit during the cremation mode will be considered a violation of this permit condition. A District approved continuous temperature monitoring and recording device shall be installed to ensure compliance with this condition. The location of the thermocouple shall be approved by the Source Test Section of the District. Natural gas input to the secondary chamber burner shall be increased, if necessary, to increase temperature sufficiently to control odor and visible plume.(Basis: Regulation 6-301, 6-310; TBACT)
3. After the shutdown, no cremation shall take place until the cremator has been preheated so that the temperature in the secondary chamber is at least 1650 degree Fahrenheit. (Basis: Regulation 6-301, 6-310; TBACT)
4. The cremator shall be fueled with natural gas only.
   (Basis: cumulative increase; TBACT)
5. The cremator shall be used to cremate only human remains. No other material contaminated with toxic air contaminants as listed by Air Resources Board, including radioactive and biohazardous waste shall be incinerated in this cremator without prior approval of the District.
   (Basis: cumulative increase; toxic risk screen)
6. The District may require the owner/operator of the cremator to conduct a District approved source test to determine particulate matter,

hydrocarbon, NOX, CO, O2, HCl, and toxic emissions under unusual conditions, such as: obese case, disaster bags. The Source Test Section of the District shall be contacted to obtain approval for the source test method. The Source Test Section shall be notified at least 7 days in advance of any expected source test. A copy of source test report for each test shall be provided to the District within 30 days of source test date. (Basis: cumulative increase; toxic risk screen)

7. The cremator shall have sampling ports and platforms, the location of which shall have the approval of the Source Test Section of the District. (Basis: Regulation 6-310)
8. An operator shall be present at all times during cremations. (Basis: Regulation 6-301)
9. The cremator shall be kept in good working condition. The date and detailed description of the type of maintenance done on cremator shall be recorded in a District approved logbook. (Basis: Regulation 6-301, 6-310)
10. All monitoring, source test, and maintenance records as required per conditions 2, 6, and 9 shall be kept on site for at least two years from the date of data entry, and shall be made available to the District staff for inspection. (Basis: cumulative increase, TBACT; Regulation 6-301, 6-310)

RECOMMENDATIONS

It is recommended that Keaton's Mortuary may be issued an Authority to Construct the cremator described in the background section of this report.

EXEMPTION: None.

BY:_____
Dharam Singh, AQE II